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10/534,042	11/15/2005	Takuji Yoshimoto	0171-1205PUS1	2382
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EXAMINER NELSON, MICHAEL E				
ART UNIT		PAPER NUMBER		
1794				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/534,042

Applicant(s)

YOSHIMOTO ET AL.

Examiner

MICHAEL E. NELSON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. In response to Applicant's reply dated 08/29/2008, claims 1-11 are pending.
Claims 1-2, 4-6 have been amended. Claim 11 has been cancelled.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

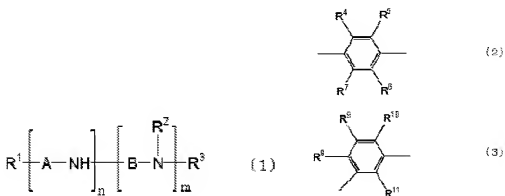
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kosho et al. (JP 2002-151272).
4. Concerning claims 7-9, Kosho et al. describe an oligoaniline used as a carrier transport auxiliary layer between an anode and organic layer [0009] (charge transporting oligomer with an aniline conjugated unit) derivative having the general structure shown below, where R¹, R², and R³ are hydrocarbon or organooxy groups, [0011], and also include hydrogen [0016]. A and B have the formula (2) or (3) shown below, where R⁴-R¹¹ are hydrogen, or monovalent hydrocarbon, hydroxyl, etc. [0013], and where m+n<=20 [0013]. The materials described by Kosho et al. have MW

between 200 and 500,000 by virtue of the fact that they have a repeat number of less than 20. Kosho et al. disclose a specific example where A and B are phenylene, and the total repeat number is 4, which would have a molecular weight less than 500,000



5. Concerning claims 7-9, Kosho et al. disclose the use of the material discussed above to form a charge transporting thin film, (as illustrated in Tables 2-5, [0032]-[0037]), which is used as an auxiliary layer (hole injection layer) between an anode and hole transporting layer in an organic electroluminescent element (per claims 8-9 (as illustrated in Tables 2-5, [0032]-[0037])).

6. Although Kosho et al. does not disclose the process where the auxiliary layer (hole injection layer) is formed from a composition comprising a solvent with a particular viscosity, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964,

966 (Fed. Cir. 1985) . Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See MPEP 2113.

7. Therefore, absent evidence of criticality regarding the presently claimed process and given that Kosho et al. meets the requirements of the claimed composition, Kosho et al. clearly meet the requirements of present claims. While the composition may include a solvent with a particular viscosity, the device itself does not include the solvent. Given the description of the devices in the specification where the layer is formed by deposition of the charge transporting varnish onto a substrate, followed by solvent evaporation (page 18, lines 28).

8. Claims 1-3, 7-9 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujita et al., (US 6,720,029) with evidence of inherency provided by Flick (*Industrial Solvents Handbook*, 5th edition, p. 367).

9. Concerning claims 1, Fujita et al. describe coating liquids for forming an organic layer of an organic LED display, which comprises an organic material and at least one low volatile liquid solvent. (abstract) Fujita et al. discloses that suitable solvents include glycols, such as propylene glycol and cyclohexanol. (Fujita, claim 5 and column 5, lines 11-16) Fujita discloses that additives may be added including dopants such as acceptors, and donors. (column 4, line 66-column 5, line 10) Fujita et al. disclose that polymer materials, including Polyaniline (PANI) and Polythiophenes

(PEDT) are suitable (column 5, lines 54-61) as well as low molecular materials, such as TPD, NPD and oxydiazoles. (column 5, line 66-column 6, line 2). TPD is N,N'-bis-(3-methylphenyl)-N,N'-bis-(phenylbenzidine) (column 5, lines 3-4), which is a charge transporting monomer having conjugated units and a molecular weight of between 200 and 5000 (per claim 2), and consists of phenylene conjugated units (per claim 3).

10. Propylene glycol has a viscosity of 56 centipoise at 20°C, as reported by Flick, which is the same as 56 mPa.s. Cyclohexanol has a viscosity of 68 mPa.s according to Applicant's specification.

11. Concerning claims 7-9, Fujita et al. describe organic electroluminescent devices comprising a thin film (per claim 7) formed of the compositions described. (column 6, lines 32-36) Fujita et al. discloses that the thin film may be a charge transporting layer formed on the first electrode (hole transporting layer). (column 7, lines 46-50)

12. Concerning claim 11, the materials described by Fujita et al. are amorphous, particularly since they are in solution or suspension, and are not crystalline.

13. Claim 1 and 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Palaniappan et al. (6,630,567).

14. Concerning claim 1, Palaniappan et al. describe a process for preparing electrically conductive polyaniline salts in organic solvents. (abstract) Specifically, Palaniappan et al. disclose polyaniline solutions in a mixture of polyaniline salt, N-methyl-2-pyrrolidone, and cyclohexanol (See Example 2, (column 4), and Table 1). Cyclohexanol has a viscosity of 68 mPa.s, according to Applicant's specification (see

page 24, line 18). The specific polymer materials used are not disclosed. However, given the extremely broad molecular weight range, it is reasonable to predict that the polymer materials would fall within that range.

15. Concerning claim 11, the materials described by Palaniappan et al. are amorphous, since they are polymeric and non-crystalline.

16. Claims 1, 7-8 and 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Louwet et al. (7,048,874) with evidence of inherency supplied by Flick (*Industrial Solvents Handbook*, 5th edition, p. 367).

17. Concerning claim 1, Louwet et al. disclose aqueous or non-aqueous solutions or dispersion of polythiophene or thiophene copolymers (abstract). Specifically, Louwet et al. describe compositions of polythiophene in non-aqueous solvents, including specifically compositions of PEDOT/PSS in mixtures of butanol, propylene diol, and diethylene glycol. (see invention examples 4 to 7, and table 3, and column 19, lines 27-33) The molecular weight of some of the specific PEDOT polymers is 390,000 and 490,000. (see Table 1 for example)

18. Propylene glycol has a viscosity of 56 centipoise at 20°C, as reported by Flick, which is the same as 56 mPa.s.

19. Concerning claims 7-8 and 10, Louwet et al. disclose the use of the compositions in thin films, particularly in organic electroluminescent devices, and photovoltaic devices (solar cells). (column 18, lines 51-54)

20. Concerning claim 11, the materials described by Louwet et al. are amorphous, because they are polymeric, and non-crystalline.

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosho et al. (JP 2002-151272) as applied to claim 1 above, and further in view of Ito et al. (5,993,694).

23. Concerning claim 10, Kosho et al. describe the composition discussed above and its use in the formation of a charge transporting film in an electroluminescent device. Kosho et al. are silent on the use of the composition for the formation of a solar cell.

24. It is commonly known in the art that organic charge transporting materials are used interchangeably in both electroluminescent devices and photovoltaic devices (solar cells), since the materials serve the same function (transporting charges). One example is described by Ito et al. who describes poly(aniline) materials suitable for both photovoltaic elements and electroluminescent elements (Column 1, lines 18-19).

25. Given this teaching, it would have been obvious to one of ordinary skill in the art to use the composition described by Kosho et al. as a charge transporting material in a

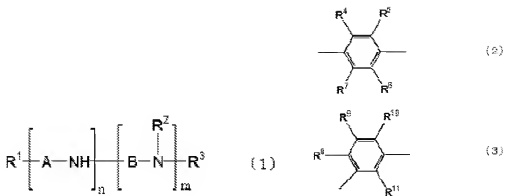
solar cell, since the material would function in the same way in both devices, specifically as charge transport materials.

26. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al., (US 6,720,029) with evidence of inherency provided by Flick (*Industrial Solvents Handbook*, 5th edition, p. 367) as applied to claims 1-3 above, and further in view of Kosho et al. (JP 2002-151272).

27. Concerning claims 4 and 6, Fujita et al. describes charge transporting liquid compositions comprising solvents having a particular vapor pressure, including propylene glycol and cyclohexanol, both of which have a viscosity between 50 and 200 mPa.s, as discussed above. Fujita et al. discloses that any known material can be used as the charge transporting low molecular material, and that dopants such as acceptors and donors can be added (column 5, line 66-column 6, line 9). Fujita et al. also disclose polymer materials, such as polyaniline, as discussed above.

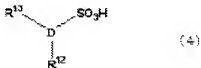
28. Fujita et al. are silent on a specific oligoaniline charge transporting material.

29. Kosho et al. describe an oligoaniline used as a carrier transport auxiliary layer between an anode and organic layer [0009] (charge transporting oligomer, per claim 2, with an aniline conjugated unit, per claim 3) derivative having the general structure shown below, where R¹, R², and R³ are hydrocarbon or organooxy groups, [0011], and also include hydrogen [0016]. A and B have the formula (2) or (3) shown below, where R⁴-R¹¹ are hydrogen, or monovalent hydrocarbon, hydroxyl, etc. [0013], and where m+n<=20 [0013]



30. Kosho et al. disclose that the material is dissolved in a solvent, such as N-methyl pyrrolidone, N,N-dimethylacetamide, or N,N-dimethylformamide, which may be used as a mixture with other solvents. [0020] Kosho et al. discloses as examples of solvents, solvents identical to those also disclosed by Fujita et al. Since the materials described are identical to the materials of Applicant's claim 4, and the material described in the specification, it is presumed to inherently meet the molecular weight requirements of Applicant's claims 1-2.

31. Concerning claim 6, Kosho et al. discloses the use of a dopant with the oligoaniline derivative discussed above, having the structural formula (4) shown below, where D is a benzene, naphthalene, anthracene, phenanthrene, and R¹² and R¹³ are carboxyl or hydroxyl independently. [0019]



32. Kosho et al. disclose that the material is soluble in organic solvents, and produces electroluminescent devices which are excellent in heat resistance and

endurance. [0006] Kosho et al. discloses compositions comprising solvents already described by Fujita et al. and it would therefore have been obvious to one of ordinary skill in the art to use the charge transport materials described by Kosho et al. in the charge transporting compositions described by Fujita et al., since the solvents would be predicted to function in the same manner (as low vapor pressure solvents, as described by Fujita et al.), and the compositions are dried to form the organic electroluminescent devices, and would provide an electroluminescent device excellent in heat resistance and endurance.

33. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al., (US 6,720,029) with evidence of inherency provided by Flick (*Industrial Solvents Handbook*, 5th edition, p. 367) as applied to claims 1-3 above, and further in view of Amano et al. (JP 04304465).

34. Concerning claim 5, Fujita et al. discloses that the organic material for the coating liquid may known low molecular charge transporting materials for the organic LED display and organic photoelectric conductor. (column 5, lines 51-53) Fujita et al. further discloses that the coating liquid may also contain a polymer material that is not conductive and fluorescent, such as polycarbonate, or polymethylmethacrylate. (column 6, lines 3-5) Fujita et al. discloses that the use of low vapor pressure solvents prevents clogging of printing nozzles during ink-jet techniques, and that the organic layer is formed with a flat surface. (column 2, lines 25-36) Fujita et al. are silent on the use of dithiin materials as the charge transporting material.

35. Amano et al. describes charge transporting materials for electrophotographic conductors having the structure shown in Table 2 (page 4) or Table 6 (page 8). These materials meet the requirements of claim 5 where q is 1, X and Y are both phenylene, r and p are both 1, and the total of $p+q+r=3$ (less than 20), R^{12} and R^{13} are either hydrogen or amino groups. Amano et al. teaches the use of the compound with a binder resin, particularly polycarbonates, and methacrylic acid ester resins. [0032] The compositions further includes a solvent (as taught by example, in paragraph [0036]).

36. Given this teaching, it would have been obvious to one of ordinary skill in the art to use the charge transporting material described by Amano et al. as the charge transporting material in the composition described by Fujita et al., since the material is known to be charge transporting, as described by Amano et al., and is used in combination with a binder resin, as disclosed by Amano et al. and Fujita et al., it would be predicted to function in the same way as a charge transporting material in the composition described by Fujita et al. with a solvent with a low vapor pressure to form a smooth layer, and prevent clogging of the nozzle during ink-jet deposition.

Double Patenting

37. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645

(Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

38. Claims 1-3, 5, 7-8, and 11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 4-6, 12-15 of copending Application No. 10/577,438 in view of Fujita et al. (US 6,720,029). Application No. 10/577,438 claims compositions of a 1,4-dithiin compound, identical to the material of present claim 5, in combination with a solvent (claim 4), used to form a thin film (claim 5), and in organic electroluminescent devices (claim 6). The materials have a repeat of less than 20, and are otherwise identical to the materials of the present claims, and would therefore meet the molecular weight requirements inherently. Likewise, the materials described are amorphous, since they are identical to the materials of the present claims, and non-crystalline in nature. The claims are silent on the particular viscosity of the solvent.

39. Fujita et al. describes charge transporting compositions for use in organic electroluminescent devices comprising solvents with a low vapor pressure to reduce nozzle clogging during ink-jet deposition. Fujita et al. discloses suitable solvents such as cyclohexanol and propylene glycol, which have viscosity between 50 and 200. Given this teaching it would have been obvious to use such solvent in the composition described in the copending application, and therefore arrive at the present claims.

This is a provisional obviousness-type double patenting rejection.

40. Claims 1-4, 6-9, and 11 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,3-8 of U.S. Patent No. 7,341,678 in view of Fujita et al. (US 6,720,029). Patent No. 7,341,678 claims a composition of a charge transporting material dissolved or dispersed in a solvent. The material has the structure according to present claim 4, where Applicant's formula (1) is a quinonediimine derivative. The copending claims also claim thin films of the material and electroluminescent devices with hole injection or hole transporting layers formed from the composition. The materials have a repeat of less than 20, and are otherwise identical to the materials of the present claims, and would therefore meet the molecular weight requirements inherently. Likewise, the materials described are amorphous, since they are identical to the materials of the present claims, and non-crystalline in nature. The claims are silent on the viscosity of the solvent.

41. Fujita et al. describes charge transporting compositions for use in organic electroluminescent devices comprising solvents with a low vapor pressure to reduce nozzle clogging during ink-jet deposition. Fujita et al. discloses suitable solvents such as cyclohexanol and propylene glycol, which have viscosity between 50 and 200. Given this teaching it would have been obvious to use such solvent in the composition described in the copending application, and therefore arrive at the present claims.

Claim 1-4, 6-9, and 11 are directed to an invention not patentably distinct from claims 1,3-8 of commonly assigned U.S. Patent No. 7,341,678. See discussion above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned U.S. Patent No. 7,341,678, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

Response to Arguments

Applicant's argue that Kosho et al. is not a relevant reference against the present claims in light of the comparative data that establishes the criticality of using a varnish composition comprising a solvent with viscosity of 50-200 mPas. It is noted that Kosho et al. is no longer applied singly against amended claims 1-6 that require such solvent. However, it is also noted that the data is not persuasive for the following reasons.

Applicant's argue that compositions formed from the use of a more viscous solvent produces a film with improved properties compared with films formed using solvents disclosed in the prior art. Applicant points to Table 2 of the specification (and in the arguments) to support this assertion. However, the thin films shown in table 2 are not directly comparable, since the film thicknesses are not the same. The table indicates that as the film thickness increases, the surface roughness decreases, though the thickness change is much greater than the difference between the comparative and inventive examples. However, all of the examples were formed on ITO coated glass surfaces which are known to have significant roughness inherent to the particular method of formation. A thinner layer will logically show more of the roughness of the underlying layer than a thicker layer. Therefore the effect of the particular solvent in the composition is uncertain. Neither does the data show that the improvement in surface roughness is based on the viscosity of the solvent, but shows an effect of a specific solvent. As discussed above, many solvents with increased viscosity are known to be used in charge transporting compositions. Neither does the data show a difference in the performance of an electroluminescent device based on the different solvent used for the formation of the device, but only a difference in layer roughness.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL E. NELSON whose telephone number is

(571)270-3453. The examiner can normally be reached on M-F 7:30am-5:00pm EST (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael E. Nelson
Examiner
Art Unit 1794

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794